

CLAIMS

1. A component for a shaped charge perforator, the component comprising a plastics material matrix having at least one non-explosive filler embedded therein.

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2. A component according to any preceding claim comprising a first portion and a second portion, the first and second portions comprising different ratios of filler to matrix.

10 3. A component according to claim 1, in which the filler is distributed homogeneously throughout the matrix.

4. A component according to any preceding claim in which the component comprises a shaped charge liner.

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5. A component according to any preceding claim in which the component comprises a shaped charge case.

6. A component according to claim 5 in which the shaped charge case is reinforced.

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7. A component according to claim 6 in which reinforcement is provided by means of a preform.

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8. A component according to claim 7 in which the preform is formed by at least one of hand laying up, filament winding, compression moulding, and braiding.

9. A component according to claim 6 in which reinforcement is provided by means of individual rovings.

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10. A component according to any preceding claim in which the filler volume is in the range 45% to 85% of the combined volume of filler and matrix.

11. A component according to any preceding claim in which the filler volume is in the range 45% to 65% of the combined volume of filler and matrix.

12. A component according to any preceding claim, wherein the filler comprises particles of substantially uniform size.
- 5 13. A component according to any preceding claim in which the particles size lies in the range 10-250 nm.
14. A component according to any preceding claim, wherein the filler is a fibre.
- 10 15. A component according to any preceding claim, wherein the filler is a flake.
16. A component according to any preceding claim, wherein the filler is a non-metallic material.
- 15 17. A component according to any preceding claim, wherein the ratio of filler density to matrix density is substantially unity.
18. A component according to any preceding claim in which the filler has a density in the range between 0.5 gcm⁻³ and 5 gcm⁻³.
- 20 19. A shaped charge perforator comprising one or more components according to any preceding claim.
- 25 20. A shaped charge perforator according to claim 19 comprising a case, a liner and a quantity of explosive packed between the case and the liner.
21. A perforator gun comprising one or more shaped charge perforators according to any one of claims 19-20.
- 30 22. A compound for use in manufacture of components for shaped charge perforators under vacuum, the compound comprising a plastics material matrix having at least one non-explosive filler embedded therein and in which the filler volume comprises 45% to 85% of the combined volume of filler and matrix.

23. A manufacturing method for a component for a shaped charge perforator, the method comprising compounding a matrix of plastic material with particulate filler under vacuum.
- 5 24. A method according to claim 23 in which the component comprises at least one of a shaped charge liner and a shaped charge case.
25. A method according to any one of claims 23-24 in which the filler volume comprises 45% to 85% of the combined volume of filler and matrix.
- 10 26. A method according to any one of claims 23-25 in which the component comprises a first portion and a second portion, the first and second portions comprising different ratios of filler to matrix.
- 15 27. A method of improving fluid outflow from a well borehole the method comprising perforating the borehole by means of a perforating gun according to claim 21.
28. A method according to claim 27 in which the fluid is one or more of hydrocarbons, water, and steam.
- 20 29. A liner for a shaped charge perforator, the liner comprising a plastics material matrix having at least one non-explosive filler embedded therein, the filler being non-uniformly distributed throughout the liner whereby to tune the liner.
- 25 30. A liner for a shaped charge perforator, the liner comprising a plastics material matrix having at least one non-explosive filler embedded therein, the liner being of non-uniform thickness whereby to tune the liner.
31. A liner for a shaped charge perforator, the liner comprising a plastics material matrix having at least one non-explosive filler embedded therein, the filler being substantially density-matched to the plastics material.